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LEPTOSPIRA ICTEROHAEMORRHAGIAE INFECTION IN THE CALF

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The history of leptospirosis in this country consists of the knowledge of infection with *L. icterohaemorrhagiae* since 1922 and of infection by *L. canicola* since 1945. Following the recognition of *L. icterohaemorrhagiae* infection (Weil's disease) in man in 1922, further reports appeared at frequent intervals. Alston (1949) collected records of nearly 1,000 proved cases of infection occurring in human beings in Great Britain during the period 1933 to 1948. He analysed the cases in relation to the patients' occupations and found that a relation to rat infestation in wet areas was evident in most. The disease was not uncommon in farm workers. Several workers have surveyed the incidence of *L. icterohaemorrhagiae* infection in rats—in particular, the brown rat, *Rattus norvegicus*. An analysis of the results obtained shows that some 30 to 40 per cent. of brown rats harbour the organism in the kidney. The spread of infection to man is generally due to the fact that the rodents excrete the organism in urine. In 1925, Okell, Dalling and Pugh reported *L. icterohaemorrhagiae* infection in dogs, and stressed the importance of the epizootic form occurring in kennels. It is accepted that, as in man, canine infections are contracted from the voided urine of carrier rats, although there is little doubt that in outbreaks infection occurs directly from dog to dog. Dunkin and Laidlaw (1925) isolated this organism from a sick, jaundiced wild fox, and Brown and Cleveland (1932) recorded a human case of Weil's disease in which the source of infection was evidently a ferret which later died.

L. icterohaemorrhagiae has been isolated in other countries from pigs, cattle, goats and apes, and serological evidence of previous infection has been found in cats and horses (Joshua and Broom, 1949).

The disease varies considerably in its symptomatology both in man and the dog. In some 60 per cent. of human cases no jaundice occurs; these cases are never fatal. Similarly, *L. icterohaemorrhagiae* infection in the dog may or may not be characterised by jaundice.

The present communication records the isolation of *L. icterohaemorrhagiae* from the calf and describes also the results obtained from the experimental infection of this species.

HISTORY

In March, 1949, the viscera of a 14-day-old Aberdeen Angus calf was received for bacteriological examination. The calf had died after a five-day illness characterised by an initial temperature of 105° F., dullness, inappetence, excessive salivation and a brownish discoloration under the tongue. An intense icterus developed during the 24 hours preceding death. The history on the farm suggested that calves had died previously of the same type of infection. Some supporting evidence that the affected calf was not an isolated case of leptospira infection was obtained later, for, subsequent to the diagnosis being established, another calf on the same farm showing similar symptoms improved rapidly following the injection of *L. icterohaemorrhagiae* hyper-immune serum.

The marked degree of icterus shown by the visceral organs, and in particular by the liver, suggested the possibility of leptospira infection. Cultural examination for other pathogens was negative.

ISOLATION OF THE ORGANISM

One ml. amounts of an emulsion of lung, kidney and heart blood were injected subcutaneously into two guinea-pigs. On the eleventh day following the inoculation, one guinea-pig died and a *post-mortem* examination revealed a haemolytic jaundice typical of *L. icterohaemorrhagiae* infection. An emulsion of liver and kidney tissue from this guinea-pig was prepared and 0·5 ml. was injected intraperitoneally into each of two young guinea-pigs. On the fourth day following injection, a heart blood culture was made into two tubes of Fletcher's medium. The tubes were incubated at 22° C. and leptospirae were found after four days' incubation in hanging drop preparations examined by dark ground illumination. Cultures were submitted to Dr. J. C. Broom, who later confirmed that the isolated organism was *L. icterohaemorrhagiae*.

On the fifth day following injection the second of the two guinea-pigs developed jaundice and died. *Post-mortem* examination showed typical haemolytic jaundice. Subsequent passage of infective material in guinea-pigs regularly produced jaundice and death in from five to eight days.

PROTECTION EXPERIMENTS IN GUINEA-PIGS

A protection experiment in guinea-pigs showed clearly that the isolated strain was *L. icterohaemorrhagiae*. The results obtained in this experiment are shown in Table I (over-leaf).

ISOLATION OF *L. icterohaemorrhagiae* FROM RATS

Four rats were trapped on the farm where the clinical cases had occurred in calves, an emulsion was prepared from the pooled urine, livers and kidneys and 1·0 ml. was injected intraperitoneally into each of two guinea-pigs. One guinea-pig died on the eleventh day and the other on the 12th day following injection. Both showed typical haemolytic jaundice at *post-mortem* examination and leptospirae were demonstrated in the liver and kidneys. This finding indicated that a potential source of infection was present on the farm.

THE EXPERIMENTAL INFECTION OF CALVES

METHOD:

An emulsion was prepared from the livers and kidneys

TABLE I

PROTECTION EXPERIMENT IN GUINEA-PIGS AGAINST A SUSPECTED STRAIN OF *L. icterohaemorrhagiae*

Group	Number of guinea-pigs	Treatment	Result.
A	3	Injected with a mixture of equal parts of *L. icterohaemorrhagiae* hyper-immune serum and infective material. Dose 2 ml. intra-peritoneally	Survived
B	3	1·5 ml. hyper-immune serum subcutaneously followed in 18 hours by 1·0 ml. infective material	Survived
C	3	Controls 1·0 ml. infective material intraperitoneally	Two died on fifth day and one on sixth day. All showed haemolytic jaundice at *post-mortem* examination

of infected guinea-pigs. Six calves were dosed with this infective material as follows:—

Calf No. 1—15 ml. of emulsion by mouth.

Calves Nos. 2, 3 and 4—10 ml. of emulsion intraperitoneally.

Calves Nos. 5 and 6—5 ml. of emulsion intraperitoneally.

In addition, two guinea-pigs were each given 0·5 ml. of the emulsion intraperitoneally. One guinea-pig died on the sixth day and the other on the eighth day following injection. Both showed haemolytic jaundice on *post-mortem* examination.

RESULTS

Calf No. 1

This calf showed no temperature reaction or clinical disturbance following infection and no agglutinins to *L. icterohaemorrhagiae* were present in a blood sample collected on the 22nd day after dosing. The visceral organs were macroscopically normal at slaughter and no leptospirae were seen in sections of liver and kidney stained by Levaditi's method.

Calves Nos. 2, 3 and 4

All three calves showed a febrile reaction on the fourth or fifth day following dosing. The temperatures rose to 106 to 107° F. on the sixth and seventh days and gradually returned to normal by the tenth day. This reaction was accompanied by inappetence, depression, loss of condition and in the case of two of the calves, slight sclerotic icterus.

Calf No. 2 was destroyed 27 days after dosing. The liver showed signs of jaundice and leptospirae were seen in sections of liver and kidney stained by Levaditi's method. The blood agglutination titre to *L. icterohaemorrhagiae* at death was 1:300.

Calf No. 3 died on the 17th day after dosing. The visceral organs appeared macroscopically normal on *post-mortem* examination but leptospirae were present in sections prepared from the kidneys.

Calf No. 4 died on the 41st day following dosing, after a terminal period of weakness, scouring and increasing debility. Urine collected from this calf on the eleventh day following infection produced typical haemolytic jaundice when injected into guinea-pigs.

Calves Nos. 5 and 6

Calf No. 5 was killed on the 16th day following injection. The visceral organs appeared macroscopically normal. Blood and urine were collected and injected into guinea-pigs but the test animals died within 24 hours of injection.

Calf No. 6 was killed 65 days after dosing. The visceral organs appeared normal at *post-mortem* examination. The urine was collected and centrifugalised. The deposit was re-suspended in sterile normal saline and 1·0 ml. of the suspension injected intraperitoneally into each of four guinea-pigs. The guinea-pigs survived the injection and later, when challenged with culture of *L. icterohaemorrhagiae*, they resisted the infection, whereas four control guinea-pigs developed typical haemolytic jaundice.

Liver and kidney sections stained with haematoxylin and eosin were prepared from calves Nos. 2, 3, 4 and 5. An interstitial nephritis was present in all kidneys but liver changes were more variable. All livers were hyperaemic and that from calf No. 2 showed a generalised parenchymatous degeneration with small areas of necrosis and hyperplasia of connective tissue. Calves Nos. 3 and 5 showed similar but less severe changes, whereas the liver in calf No. 4 was normal.

The serological reactions of the experimentally infected calves are shown in the following table:—

TABLE II

SEROLOGICAL RESPONSE OF CALVES TO EXPERIMENTAL INFECTION WITH *L. icterohaemorrhagiae*

Calf No.	Route of infection and dose	No. of days following experimental dosing				
		9	12	14	16	18
1	15 ml. orally	—	—	—	—	—
2	10 ml. intra-peritoneally	—	—	—	—	—
3	10 ml. intra-peritoneally	1 : 30	1 : 100	1 : 1,000	—	—
4	10 ml. intra-peritoneally	1 : 30	1 : 300	1 : 300	—	1 : 1,000
5	5 ml. intra-peritoneally	1 : 300	1 : 300	1 : 1,000	1 : 3,000	—
6	5 ml. intra-peritoneally	1 : 30	1 : 100	1 : 100	—	1 : 300

Calf No.	Route of infection and dose	No. of days following experimental dosing				
		20	22	24	25	31
1	15 ml. orally	—	—	—	—	—
2	10 ml. intra-peritoneally	—	1 : 300	—	—	—
3	10 ml. intra-peritoneally	—	—	—	—	—
4	10 ml. intra-peritoneally	1 : 1,000	—	1 : 1,000	1 : 1,000	—
5	5 ml. intra-peritoneally	—	—	—	—	—
6	5 ml. intra-peritoneally	1 : 300	—	1 : 300	—	1 : 300

The Presence of Agglutinins to L. icterohaemorrhagiae *in the Sera of Normal Cattle.*—The nature of the technique of the agglutination test for the demonstration of antibodies to leptospirae has precluded any extensive observations being made in this laboratory. Serum samples from 16 cattle have been examined for agglutinins to *L. icterohaemorrhagiae* and a titre of 1:30 was found in one. Most workers are agreed that the serological reaction is entirely specific, agglutinins being formed as a result of leptospira infection only and a titre of 1:10 in human serum is accepted as evidence of old infection (Smith and Davidson, 1936). A titre of 1:30 in the cow may therefore be taken as evidence of previous infection.

Discussion

There is no previous record to show that leptospira infection has been diagnosed in cattle in this country, yet it may be regarded as surprising that the disease has not been encountered more frequently in calves in view of the high incidence of rodents in and around farm buildings. It might be expected that the incidence of the disease, if it is in any way common, would be higher during the winter months when the rodent population in farm buildings is at its highest. In the case now reported, leptospirae were isolated from rats trapped on the farm where clinical cases had occurred, and although this, in itself, does not prove that rats acted as the source of infection, it shows that a potential source of infection existed.

The experimental finding that infected calves do not necessarily develop jaundice is in keeping with observations on the clinical disease in human beings and in dogs. The non-specific nature of the clinical symptoms and the *post-mortem* observation that the visceral organs of calves dying from leptospira infection may show no macroscopic lesions suggests that dark ground examinations of urine from calf carcases submitted for examination would be a worth-while diagnostic procedure. The presence of agglutinins in the sera of an adult cow is indicative of previous infection and is confirmatory evidence that the cases reported are not isolated ones.

Reports from other countries show that several types of leptospira, which are carried by rodents and cause disease in man, may also be infective to livestock and human infections may be contracted from domestic animals. In addition, leptospira infections, for which there are no known rodent vectors, occur in pigs and cattle and some of these infections may be transmitted to man or to other animal species. *L. pomona*, the cause of swineherds disease in humans, appears primarily to infect pigs and is excreted in the urine of the host. The same organism has been isolated recently in Queensland from cases of icterohaemoglobinuria in calves (Sutherland, Simmonds and Kenny, 1949). This disease of calves has been known in Queensland for many years and occurs frequently in calves reared in proximity to piggeries. Thus it appears that pigs, which may suffer a mild infection only but excrete the organism in urine for up to a year, may act as a source of infection to calves, and that pigs or calves may be a source of infection to human beings. The leptospiroses of animals occurring in various parts of the world have been reviewed recently by Broom (Joshua and Broom, 1949).

One purpose of this communication is to emphasize that in Great Britain, only two species, *L. icterohaemorrhagiae* and *L. canicola* have been identified, in contrast with at least ten species on the continent of Europe. It is possible that other leptospiral infections occur in this country but have not been recognised. This view is supported by the fact that rodents, shown to be carriers of various leptospiral species in Europe, are also native to this country. No adequate surveys have been undertaken to determine whether such rodents are infected, although Elton and his colleagues in 1931 found leptospirae in the kidneys of 29 wood mice (*Apodemus sylvaticus*). However, injection of this material into the guinea-pig produced one infection only and the strain was not cultivated. The serological surveys carried out in this country on canine sera have thrown much light on the incidence of *L. canicola* infection in the dog (Stuart, 1946, Broom and MacIntyre, 1948, and Joshua, 1949) and similar surveys, carried out on the sera of farm animals, using antigens prepared from the different types of leptospira known to be infective to livestock in other countries, might well produce valuable results.

Acknowledgments.—It is a pleasure to acknowledge the help given in this work by Dr. J. C. Broom, of the Wellcome Laboratories of Tropical Medicine, who confirmed our identification of the strain of *L. icterohaemorrhagiae* and carried out the agglutination tests on the sera of the calves. Our thanks are due also to Mr. M. Mitchell for technical assistance.

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SAFEGUARDING THE POULTRY POPULATION IN NORTHERN IRELAND

Moving the second reading of the Poultry Hatcheries Bill in the Northern Ireland Parliament, the Minister of Agriculture stated that the value of the output of eggs and poultry in 1948-49 was estimated at £19,600,000. No branch of the agricultural industry, he added, had expanded more rapidly in recent years than the poultry industry: "We have probably the most concentrated poultry population of any country in the world." The poultry population in Northern Ireland increased from 10,250,000 in 1939 to almost 24,250,000 in 1949.

The Minister explained that the bill provided for the licensing of poultry hatcheries and for the prohibition of the sale of chicks in shops, markets, stalls, stands or vehicles. The proposals had the support of the Poultry Committee of the Ulster Farmers Union.

The Minister said it was important that the sale of chicks from hatcheries should not lead to the spread of disease. Unfortunately this was not the case at present. The Ministry had sought to deal with the position on a voluntary basis and in 1945 introduced a scheme for accrediting hatcheries, the operative condition being that only eggs obtained from accredited farms—that is, from blood-tested flocks—would be incubated. There were now 16 hatcheries participating in this voluntary scheme.

The present position was clearly unsatisfactory, for the non-accredited hatcheries were at liberty to draw their supplies of eggs from sources which could not be regarded as satisfactory either from the quality of the stock or the health aspects and thus there was grave risk of the industry being jeopardised by the distribution of inferior and diseased stock.

As there were now 1,141 accredited farms as compared with only 174 in 1941-42, he was satisfied that ample supplies of hatching eggs would be forthcoming.

THE TOXICITY OF ANTRYCIDE DIMETHOSULPHATE

BY

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Antrycide dimethosulphate was introduced into this laboratory for the experimental treatment of bovine trypanosomiasis late in 1948. The information available at that time as to its possible toxicity was confined to a statement that doses up to 100 mg. of antrycide per kg. live weight could be used with safety. Later, Curd and Davey (1949) reported that toxic effects were not encountered even with doses of antrycide chloride many times those necessary for cure. It has since been learned from Dr. Davey that this dosage applied only to the relatively insoluble chloride and that he considered 12 mg. per kg. to be the safe maximum dose of the dimethosulphate for cattle. It is understood that the safe level has been further reduced to 10 mg. per kg. As will be seen later, severe symptoms have been encountered following doses of 7·5 mg. per kg.

Symptoms following treatment with antrycide dimethosulphate were first observed in a batch of ten young cattle experimentally infected with *T. congolense* (Shika strain) and dosed at the rate of 5 mg. per kg. live weight (the therapeutic dose initially recommended). Two hours after treatment five animals showed salivation, spasm of the diaphragm, repeated defaecation and pyrexia. Two showed general muscular trembling; all were off food and very dull. Symptoms were declining in severity after four hours, but one animal was still very lethargic and stood with head extended and depressed. Later this animal developed a very profuse liquid diarrhoea which persisted for over 24 hours. A second animal also showed diarrhoea of a rusty brown colour. All animals had recovered completely 36 hours after the injection.

The possibility that the drug might have a sympathetico-mimetic action was suggested. In order to investigate this hypothesis and, further, to observe the effect of antrycide on animals not harbouring trypanosomes, six healthy cattle and two healthy horses were given a full therapeutic dose (5 mg. per kg.), the blood sugar being estimated at half-hourly intervals over a period of five hours. Both horses and three of the cattle showed mild symptoms of trembling, salivation and spasm of the diaphragm. The body temperature was not raised. There were small areas of perspiration over the flanks and in the perineal region in one horse. All animals were normal six hours later. No significant rise in the blood sugar was observed in the cattle given antrycide as compared with three control animals given distilled water subcutaneously. The blood sugar values in the horses fell from 88 and 84 mg. per cent. to 74 and 61 mg. per cent. respectively during the first hour and had returned to slightly above the initial value after three hours. It is of interest, in this connection, to note that a dose of 10 mg. per kg. gave rise to a significant increase in blood sugar in three further cattle, corresponding approximately to that produced by the subcutaneous injection of 0·1 gr. of adrenaline hydrochloride. The blood sugar was still rising at the end of five hours, but had returned to normal after 15 hours. The symptoms produced by this double dose were only slightly exacerbated.

It was considered worth while to continue the experiments in small animals.

Antrycide was given to guinea-pigs, in the form of a 0·1 per cent. solution, at the rate of 5 mg. per kg. The first symptoms were seen approximately 30 minutes after the injection. The most noticeable feature was spasm of the diaphragm; the heart rate was slowed (typically from 240 per minute to 106 per minute) and there appeared to be a progressive muscular paralysis, the head sinking until it rested on the ground and the hind legs being extended. The position of the animal at this stage resembled the typical "face-ache" position of scurvy and recalled to mind the "head-drop" test used in the biological assay of curare. Forty-five minutes after the injection, respiration had almost ceased, but recovery was extremely rapid and five minutes later the animals appeared perfectly normal and unharmed.

With a dose of 10 mg. per kg., symptoms commenced after 15 minutes with the passage of a large quantity of faeces. After 30 minutes respiration was extremely slow and shallow and a cursory examination would have given the impression that the animal was dead. The corneal reflex disappeared, but there seemed to be an increase in skin sensitivity. This state of affairs lasted for nearly 15 minutes, but again recovery was rapid and uneventful.

One hundred mg. per kg. produced symptoms of muscular paralysis in two minutes; respirations ceased five minutes after the injection and the heart stopped within eight minutes. An immediate *post-mortem* examination revealed no particular lesions other than a slight congestion of the vessels of the small and large gut. The right heart had stopped in diastole and the left in systole.

Doses of 100 mg. per kg. produced death in a rabbit, a rat and a calf (the latter admittedly in a very poor condition) in seven, 30 and 20 minutes respectively. The symptoms before death were, in each case, those of acute shock; defaecation and urination were stimulated, the skin felt warm and damp and, in the case of the calf, it was noticed that the pupils were constricted slightly and that the eyes were bulging, possibly due to an increase in intraocular pressure. No obvious lesions were found on *post-mortem* examination.

In all, antrycide appeared either to stimulate the parasympathetic system or to inhibit the sympathetic nervous system. It also appeared to have a curare-like action in producing general muscular paralysis.

The observations at this stage were communicated to Dr. Davey in April, 1949. It was felt that a detailed study of the pharmacology of the drug could best be left to those equipped for the work.

From May to August, 1949, many of our experimental cattle became infected with *T. vivax*, as a result, it is thought, of mechanical transmission, probably by stomoxys. As the initial experiments on the curative action of the drug had indicated that a dosage of 5 mg. per kg. might not be sufficient to ensure complete sterilisation from *T. vivax*, and in order to avoid the possibility of resistant strains developing, antrycide was given at the rate of 7·5 mg. per kg. In several cattle trypanosomes were observed to persist in the blood for several days following treatment, their numbers not diminishing perceptibly. A second dose of 7·5 mg. per kg. was given to these animals and this second dose invariably was followed by toxic symptoms which included loss of appetite, inability to stand and dementia, animals running round in small circles and becoming completely intractable until they went down.

Diarrhoea in varying degrees persisted for several days. Most animals recovered, but three died, one on the sixth day and two on the 14th day following treatment.

The *post-mortem* findings included ascites (inconstant), acute inflammation of the abomasum, small intestines and rectum, sometimes accompanied by patchy haemorrhages. In two cases the rectal mucosa showed the " zebra " markings of rinderpest, although there were no other signs of this condition, and the rectum was filled with clotted blood. The liver was hard and fibrous, often bile-stained, and the gall-bladder was greatly distended, containing as much as 750 ml. of yellowish-brown bile. The kidneys were congested, the cut surface oozed blood, and the pelvis had gelatinous changes. The lungs were emphysematous and had patches of congestion. The pericardium contained up to 200 ml. of blood-stained fluid and both the epicardium and endocardium showed petechial haemorrhages. All fat exhibited the myxoedematous changes seen in trypanosomiasis. In short, the lesions were what would be expected as a result of chronic trypanosomiasis, together with those of an acute gastro-enteritis.

Two further cattle showed severe symptoms after a single dose of 7·5 mg. per kg. Both animals were slaughtered *in extremis*, one with a prolapsed rectum. The *post-mortem* findings were, in general, similar to those outlined above.

The symptoms and lesions resemble those described by Wilson (1949) in Uganda.

It would appear that large doses of antrycide are needed to cure *T. vivax* infection of cattle and that such doses are likely to produce severe reactions, if not deaths.

Acknowledgments.—I am indebted to Mr. R. W. M. Mettam, Assistant Director of Laboratory Services, Nigeria, for the opportunity to make these observations, to Dr. D. G. Davey for his extremely valuable and stimulating discussions and to Mr. W. G. Beaton, Director of Veterinary Services, Nigeria, for permission to publish this paper.

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THOSE GRANITE TROUGHS

A note in *The Farmers' Weekly* of May 19th recalls the days when, with an enthusiast for the admirable work of the Metropolitan Drinking Fountain and Cattle Trough Association (Sir John Moore) in the chair of the Editorial Committee, its efforts to meet what was then a real need received supporting mention in these columns. The Editor writes: "To the urban sentimentalist of between 45 and 50 the letter from the Secretary of the Metropolitan Drinking Fountain and Cattle Trough Association published last week, offering to give away their stock of granite troughs, will bring a momentary pang at the passing of a piece of the scene of his youth. The Association's troughs were fine places to see the now almost non-existent town horse (how gigantic those draughters are in retrospect!) and I don't believe that any youngster to-day gets a comparable thrill. And yet, although the blacksmith's shop which existed within 100 yards of the Strand is now closed these 20 years and London no longer wants horse troughs, one or two of the latter are still in full use. One is in Gray's Inn Road, where, if you are lucky, you will come on a whole line of railway horses from nearby King's Cross station queueing up to drink (railways still find the horse the cheapest proposition for short distance hauls). The other is on the Embankment. I never see either of them without thinking of the old crack: a motor-car is a fine thing but you never want to stroke its nose."

CLINICAL COMMUNICATION

SCOURING IN CALVES FED ON MILK FROM COWS GRAZING NEW LEYS

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It has been demonstrated by Ferguson (1948) that grass and particularly clover-rich grass contains a substance which causes stimulation of the intestine with subsequent diarrhoea. No records are available of this substance passing by the milk and causing diarrhoea in suckling calves. Although this communication deals with only a small number of animals the circumstantial evidence suggests that there is a substance in rich pasture which can pass into milk and cause scouring and resultant lack of growth in calves. The pasture was suspected only after the elimination of the normal causes of scouring in calves, and following the information that scouring ceased and the calves developed normally immediately after weaning.

The history of the farm is as follows:—It was taken over in a poor condition in 1946 by the present owner, who immediately proceeded to raise its productivity by heavy manuring and other measures. Many of the pastures were ploughed up and reseeded, and a dairy herd was introduced. During 1948 a number of cows grazing the new leys developed bloat, but were treated and recovered. No trouble in rearing calves was experienced in 1948, nor did trouble begin until the cows were turned out in April, 1949. Diarrhoea occurred amongst the cows then, but cleared up after a few days. It was three months later before it was realised that the diarrhoea amongst the calves coincided with the turning out of the cows. All the calves which were either suckled or bucket fed on their own mother's milk developed a thin watery diarrhoea. They became listless and took their milk half heartedly. It was noticed that as the appetite became less the diarrhoea became less severe, but because of the poor appetite and the scouring, the calves lost condition and at weaning time had a stunted, badly nurtured appearance. It was observed, too, that when the affected calves were weaned they rapidly put on flesh and in a few months were normal, well-developed, healthy animals and because of this observation some of the calves were weaned much earlier than usual. The younger the unweaned calves were at the time when the cows were turned out to grass, the poorer became their appearance as they grew older.

The normal causes of diarrhoea in calves were at first suspected and various palliative measures applied. These usually had a temporary beneficial effect, but proved unsatisfactory on prolonged application.

When investigation into the trouble was made it was realised that some unusual cause was responsible, and on enquiry into the details of management it was found that the condition coincided with the turning out of the cows on to pasture which had produced several cases of bloat in 1948. The possibility of substances in the new pasture passing through the mother's milk to the calves was considered and a small scale experiment on the seven calves then available was carried out. Two cows providing bucket milk to their calves were transferred to an orchard where the grass was old and rank; one cow suckling her own calf and two other calves were kept indoors and fed on dry food without access to grass; as a control two cows giving bucket milk to their two offspring were turned out

with the milking herd on to the new pastures, and these two calves were given chalk preparations daily to lessen the diarrhoea. It was reported to us that in about three days those calves whose dams had no access to new grasses had ceased scouring and from that time onwards began to thrive and grow in a normal manner. The two control calves continued to have loose motions, although the chalk did check the severe diarrhoea. These calves were left as controls for one month by which time they were poor specimens with staring coats and an ill-thriven, stunted appearance. It was then decided to discontinue the experiment and the dams of these two calves were removed from the milking herd and allowed to graze only old pasture. The loose motions quickly disappeared and the two calves thereafter began to thrive normally. During the remainder of the year no cow providing milk for calves was allowed to graze the new pastures and no further trouble appeared. At a recent inspection all the calves, whether they had been affected with diarrhoea or not, appeared healthy and physically normal for their age.

Conclusion

There is circumstantial evidence that there is a constituent of young grass which can be passed by the milk to calves and cause a persistent diarrhoea leading to retarded development.

Addendum

The following is an extract of a report made by R. Probert Davies, M.Sc., Grassland Officer, N.A.A.S.:—The field in question was reseeded in 1946 with a seed mixture composed of 16 lb. Commercial Ryegrass (probably a mixture of Irish Perennial Ryegrass and Italian Ryegrass), 2 lb. Commercial Timothy (probably Scottish), 2½ lb. American Red Clover, and 1½ lb. New Zealand Mother Seed White Clover. Since the field at the time of inspection had been ploughed up it was impossible to see the state of the pasture, but it can be assumed that after three years the grazing would in the spring of 1949 be clover-dominant with a certain amount of early ryegrass. It would be all the more rich in protein since in March, 1949, 2 cwts. of nitro-chalk was applied per acre a short time before the cattle were turned out.

Acknowledgment.—I wish to thank R. Probert Davies for his report on the grassland management.

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POOR QUALITY MEAT

At a recent meeting of the Executive Council of the National Federation of Meat Traders it was decided (states the *Meat Trades Journal*), on a resolution from Lincolnshire Council, that the Federation representatives on the Consultative Conference should press for the withdrawal from issue of low grade quality manufacturing meat, including old and emaciated cows which should be sent to the knacker yard, Alderman Hewson declaring that to-day meat was to be seen in butchers' shops which before the war would have been condemned by the Inspector as unfit for human food and the trader prosecuted.

The Pork Section, said Mr. F. A. Currey, had indicated to the Ministry that emaciated cows should not be issued for human consumption. They should, he said, be diverted to manufacturers of dog food, the only purpose for which this meat was suitable.

Past-President Partington called attention to the fact that these animals which had served their main purpose in life and had no nutritive value cost the Ministry an average of 8½d. per lb. which was, to say the least of it, perfectly silly, whereupon Mr. Kemsley suggested that the Ministry should be pressed not to purchase emaciated cows on the score that to do so at current prices was a waste of public money.

ABSTRACTS

[Observations on the Prophylactic Value of Certain Drugs for Enterohepatitis in Turkeys. McGregor, J. K. (1949.) *Canad. J. comp. Path.* **13.** 257–261.]

A trial to test the activity of various compounds against infectious enterohepatitis was planned using 494 six-weeks-old turkey poults divided into ten groups, one group of 49 birds serving as a control. All birds were kept under conditions approaching those usually encountered in the field, and were infected by the drinking water contaminated with a suspension of strained chicken faeces plus a small quantity of earth, both obtained from a range where enterohepatitis was enzootic. This suspension was sown with embryonated *Heterakis* ova in the laboratory and fed in the water for 18 days or until deaths from blackhead commenced. At first all drugs were given in the food and dosages were doubled as soon as the death rate began to mount; then some of the drug was also given in the drinking water since blackhead-infected birds lose their appetite and become thirsty. Only one of the nine compounds tested showed any appreciable effect in preventing and curing blackhead. This was a substance called Enheptin T, or compound 5051, manufactured by Lederle Laboratories, and described by them as a thiametroimidine. It was fed at a concentration of 0·05 per cent.

J. G. C.

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[A New Biological Oscillation. (Trans. title.) Laue, W. (1948.) *Berl. tierärtzl. Wschr.* No. 10. p. 114.]

In this and other papers[1 2] the discovery of a new form of radiation is described, a natural force issuing from all living organisms. It is postulated that these radiations may occupy a hitherto unexplored region in the wave-length scale, namely, between 0·25 mm. and 6 mm.

Main experimental proof consists of the production of images by the exposure of photographic plates to various tissues and organs in complete darkness. No photographic apparatus is used, the plate being suspended above the object. Precautionary measures and control experiments are described. Dr. Laue has performed hundreds of such experiments in an attempt to exclude sources of error or coincidence.

It is stated that the significance of this discovery lies in the link it affords between the biological and physical worlds and also the possible influence of the radiations on the behaviour of neighbouring organisms.

References

[1]Feldhuss, W. (1946.) "Eine unsichtbare biologische Strahlung oder Schwingung." Eckoldt, Hamburg.
[2]Dobler, P. Private communication.

R. M.

Erratum.—"Attestation: Is it a Good Policy?" (J. F. D. Tutt, *Vet. Rec.* **62.** 309 and 310): The sentence concluding the penultimate paragraph of this letter should read, "Very fortunately, unless revoked, new regulations will bring it (the Accredited Herd system) to an end in 1954"—not "1945," as printed.

* * * * *

Weekly Wisdom

Why sounds should in themselves be funny is hard to say. In the theremin we have the imposition of an all too fallible human touch upon a machine which in the baritone register suggested a cow in dyspeptic distress—and that somehow caused laughter in sober Wigmore Hall.—Times Critic on Electrophonic Music.

REVIEW

[Eugen Fröhner Lehrbuch der Toxikologie für Tierärxte. Völker, R. (Direktor des Pharmakolog. Instituts der Tierärxtl. Hochscule Hannover.) (1950.) Pp. XX + 404. Stuttgart: Ferdinand Enke. Sixth edition. DM 35.60.]

A new edition of Fröhner's "Lehrbuch der Toxikologie" is very welcome, for it is 22 years since the appearance of the previous edition of this standard German text-book. During this time much new material has come to light, and Professor Völker, in preparing the new edition, has had to revise and rearrange the text completely. It may be said at once that in this he has been most successful and has restored the book to its former usefulness.

After a section dealing with general toxicology, the inorganic compounds, organic compounds, poisonous fungi and plants and animal poisons are dealt with. The number of substances included is extensive and many of the newer drugs, such as the sulphonamides, are considered although, perhaps, they can hardly be classed as poisons in the usually accepted sense of the word. The individual compounds are dealt with under the headings of chemistry, aetiology (*i.e.*, the conditions under which they are likely to give rise to poisoning), pathogenesis, symptoms, *post-mortem* findings and treatment. Apart from a few scattered references to individual tests, the chemical detection of poisons is not dealt with, on the ground that text-books confined to chemical toxicology are available.

Perhaps owing to the interruption in the interchange of scientific journals, the references quoted are not always up to date, and there are also a few omissions in the text such as the value of sodium thiosulphate in the treatment of arsenical poisoning and the newer ideas on bracken poisoning which should have been mentioned. These, however, are minor points, and the book can be highly recommended for its comprehensive treatment of the subject. There can be no doubt that the practitioner, for whom the book primarily is intended, will find it a most useful addition to his library.

QUESTIONS IN PARLIAMENT

Scientific Specimens (Export)

Mr. Watkinson (May 16th) asked the Chancellor of the Exchequer why a C.D.3 form is required for the export of scientific specimens on an exchange basis to foreign learned and technical societies.

Sir S. Cripps: Where exports are subject to the provisions of the Exchange Control Act, the Customs must have evidence either that payment is being made by an approved method or that exportation without payment has been sanctioned. Form C.D.3 serves this purpose, and the permission required for the export of goods on an exchange basis to foreign learned and technical societies is indicated by the Bank of England by an endorsement on the form.

Mr. Watkinson: Does the Chancellor not think that this is a rather cumbersome method to cover the export of snakes to the Zoological Society of New York, when, as I understand, a C.D.3 is necessary for every exportation?

Sir S. Cripps: There are also business people who export snakes to New York for payment.

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Calves (Identifying Marks)

Mr. Vane (May 18th) asked the Minister of Agriculture what representations he has received with regard to the present method of marking the ears of calves in respect of which calf subsidy is payable; and what alternatives have been suggested.

Mr. T. Williams: I have received representations from the National Cattle Breeders' Association, the Red Poll Cattle Society and a number of private owners, who have suggested the following alternatives:

(1) The use of an instrument making a hole $\frac{3}{8}$ inch instead of $\frac{1}{2}$ inch in diameter.

(2) The use of tattoo marks.

(3) The acceptance of breed society markings as identifying marks for the purposes of the calf subsidy.

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Experiments (Living Animals)

Mr. P. Freeman (May 18th) asked the Secretary of State for the Home Department how many experiments have been performed on living animals with and without anaesthetics in 1949; and what are the corresponding figures of experiments carried out for the purpose of cancer research only.

Mr. Ede: The annual return of experiments for 1949 is in course of preparation, and the information for which my hon. Friend asks will be sent to him as soon as it is completed.

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Uncontrolled Dogs

Mr. Bossom (May 18th) asked the Minister of Agriculture what information he has as to the number of lambs and sheep killed or worried by uncontrolled dogs last year in Kent; and what action he is taking to prevent this occurring again this year.

Mr. T. Williams: During 1949, the police in Kent were notified of 147 sheep killed and 76 sheep injured by dogs. Following discussions with the National Farmers' Union I have considered very carefully whether it is possible to do any more by legislative action to prevent such losses, but have come to the conclusion that none of the proposals discussed would be practicable and effective. In Kent, as elsewhere, local authorities have regulations which make it an offence to allow a dog to be out of control during the hours of darkness, and the police have certain powers to seize stray dogs. I understand that the Kent police are taking energetic action to enforce these provisions.

Mr. Bossom: Does not the Minister realise that this is a serious situation, and that not only during the hours of darkness but during the hours of daylight this condition prevails? Cannot he do something to help the police? The police would do their best if the Minister would give them some encouragement.

Mr. Williams: If the police have any recommendations to make as to what they think might be possible, and legislatively practicable, I will look at them.

Earl Winterton: Is the right hon. Gentleman aware that in the south of England generally great cruelty is caused to sheep and lambs by uncontrolled dogs? In view of the fact that animal welfare societies seem more interested in protecting dogs than sheep and lambs which are tortured by the dogs, will he take some action such as, for example, having notices put up calling attention to the grave damage being done?

Mr. Williams: The suggestion of the noble Lord might be taken note of by the Kent or Sussex police, but I do not think the dogs would worry about a notice

Major Sir Thomas Dugdale: Will the right hon. Gentleman take note of the fact that the nuisance is not confined to Kent, but is universal throughout the country?

Mr. Williams: That is true to a greater or lesser extent.

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Accidents (Dogs)

Mr. Renton (May 18th) asked the Minister of Transport what percentage of road accidents in 1949 are estimated to have been due wholly or mainly to dogs getting in the way of motor vehicles.

Mr. Barnes: During 1949, 2,187 road accidents causing death or personal injury were reported by the police as being primarily due to dogs being on the carriageway, and this figure was $1\frac{1}{2}$ per cent. of the total of such accidents.

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Vaccine Lymph, Scotland

Mr. Viant (May 19th) asked the Minister of Health how many sheep were used at the Lister Institute to furnish the vaccine lymph sent to Scotland during the recent smallpox scare.

Mr. Bevan: The lymph was supplied from normal stocks and no sheep were specially used.

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Iodised Salt

Dr. Stross (May 19th) asked the Minister of Health if he will cause investigation to be made to establish whether iodised salt for table use or in cooking or in the preparation of food may cause any reaction in persons sensitive to potassium or sodium iodide.

Mr. Bevan: I am advised that the minute amount of iodine involved appears to make any such investigation unnecessary, but the point will be further considered in connection with other representations on these proposals.

NOTES AND NEWS

Diary of Events

May 27th.—Meeting of the Scottish Branch, N.V.M.A., at Stirling (Golden Lion Hotel), 2.15 p.m.

May 27th.—Annual General Meeting of the Society of Women Veterinary Surgeons, at the Royal Veterinary College, N.W.1, 1.30 p.m.

May 30th.—Meeting of the Welsh Branch, N.V.M.A., at Newtown (The Bear Hotel), 2 p.m.

May 31st.—Meeting of the Southern Counties Division, N.V.M.A., with demonstration, at centres near Salisbury. (See Notice.)

May 31st.—Annual General Meeting of the West of Scotland Division, N.V.M.A., in the University of Glasgow Veterinary School, 2.30 p.m.

June 2nd.—Meeting of the South Wales Division, N.V.M.A., at Tondu and Bridgend, 2 p.m.

June 7th.—**107th Annual General Meeting of the Royal College of Veterinary Surgeons, at the Royal College of Physicians of Ireland, in Dublin, 11.30 a.m.**

June 7th.—Annual General Meeting of Members of the Victoria Veterinary Benevolent Fund, at 10, Red Lion Square, London, W.C.1, 2.30 p.m.

June 8th.—R.A.V.C. Golfing Society, 1950. Meeting, at North Hants Golf Club, Fleet, commencing at 10 a.m.

June 9th.—R.A.V.C. Annual Dinner, Grosvenor House, London.

June 15th.—Joint Summer Meeting of the Sussex and South-Eastern Divisions, N.V.M.A., at the Wellcome Veterinary Research Station, Frant, 2.30 p.m.

June 30th.—Summer Meeting of the Lancashire Division, N.V.M.A. (See Notice).

July 12th and 13th.—Annual General Meeting of the Association of Veterinary Teachers and Research Workers (Northern Region), at Aberystwyth (Veterinary Department, Agricultural Building, Alexandra Road).

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R.C.V.S. Examinations

June 8th.—R.C.V.S. D.V.S.M. Written Examination commences, at Edinburgh.

June 22nd.—R.C.V.S. Membership Written Examination.

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N.V.M.A. Council and Committee Meetings

The next Council and Committee meetings of the Association will be held in London on July 12th, 13th and 14th.

The time-table is as follows:—

Wednesday, July 12th, at 36, Gordon Square, W.C.1.
11 a.m. Organising Committee.
2.15 p.m. Veterinary State Medicine Committee.

Thursday, July 13th, at 36, Gordon Square, W.C.1.
10 a.m. Parliamentary and Public Relations Committee.
11.30 a.m. Home Appointments Committee.
2.30 p.m. General Purposes and Finance Committee.

Friday, July 14th, at Connaught Rooms, Great Queen St., W,C.2.
11 a.m. **Council Meeting.**

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Joint Measurement Scheme

(for Children's Ponies, Hacks, Cobs and Jumping Ponies)

The attention of members is drawn to the following Measurement Rules adopted for the guidance of Official Measurers under this Scheme by the Societies under whose auspices the Scheme is run:—

(1) The Measuring Stick must be fitted with a spirit level, and be shod with metal.

(2) The forelegs to be perpendicular to the ground.

(3) The poll to be level with the highest point of the withers.

(4) Measurement to be taken at the highest point of the withers.

(5) A half inch to be allowed for shoes provided the animal is shod *normally*. No allowance for tips, plates or charlier shoes.

It should be noted that the Scheme specifies that animals may be measured only between April 1st and September 30th, except when an objection may overlap this period.

Openings in the Veterinary Profession for New Graduates

Issue of N.V.M.A. Leaflet

Copies are available on application to 36, Gordon Square, W.C.1, of a pamphlet, which has been prepared by the National Veterinary Medical Association, indicating the various branches of professional work which are open to members of the Royal College of Veterinary Surgeons.

As they pass through the veterinary schools all students, if they have not already made up their minds on the matter, are giving anxious thought to the problem of selecting the particular avenue of veterinary employment which appeals most to them and for which they deem themselves to be best fitted. It is for their guidance and that of new graduates that there has been compiled this publication, which describes the qualifications required, nature of the work and, where feasible, conditions of service, salaries, etc., under the following headings: General Practice, Research, Teaching, Ministry of Agriculture and Fisheries (Animal Health Division), Northern Ireland Ministry of Agriculture, H.M. Colonial Service, Openings in the Dominions, Royal Army Veterinary Corps, Veterinary Posts under Local Authorities, The Animal Health Trust, Agricultural Research Council (post-graduate scholarships and studentships), Cattle Breeding Centres, Advisory and Research Appointments with Commercial Firms and Animal Welfare Societies. The leaflet concludes with a list of useful addresses for intending applicants for posts and notes on drafting an application for an appointment.

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The International and N.V.M.A. Veterinary Congresses, London, 1949

Commemorative Pictorial Souvenir

The National Veterinary Medical Association takes pleasure in announcing the issue of a pictorial souvenir* of the meetings held jointly in London in August, 1949, of the XIVth International Veterinary Congress and the LXVIIth Annual Conference of the N.V.M.A. Produced in "Record" size, on fine art paper, this 44-page publication gives representative presentation of the scientific sessions, the ceremonial occasions and informal groupings of the delegates and their ladies, together with a number of pleasing photographs of the centres at which these gatherings took place, or which were visited by the participants. The cost of production has necessitated the issue of a limited edition, and application for copies must be made to 36, Gordon Square, London, W.C.1. Members of the Association are entitled to one copy free of charge. The cost of additional copies, and to non-members of the Association, is 5s. post free.

* N.V.M.A. Publication No. 19.

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N.V.M.A. Congress at Cardiff

The V.V.B.F. Golf Competitions

Those wishing to enter the competition for the "Simpson" Trophy and the ladies' competition for the "Dunkin" Trophy are requested to notify Mr. C. J. Pugh, M.R.C.V.S., 206, Stow Hill, Newport, Mon., who is in charge of the arrangements.

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R.C.V.S. COUNCIL

One of the representatives of His Majesty's Privy Council on the Council of the Royal College of Veterinary Surgeons—Mr. McNair Snadden, M.P.—owing to the pressure of his parliamentary work has been compelled to resign his membership of the Council, R.C.V.S. The Privy Council has accepted his resignation and has appointed in his place Mr. J. Henderson Stewart, M.P., whose term of office will expire on May 31st, 1953.

Mr. Henderson Stewart is the National Liberal and Conservative Member for East Fife, which he won at the recent election with a majority of 15,000. He has been a member since 1933 and was sessional chairman of the Liberal National Party in 1945.

Born in 1897, Mr. Henderson Stewart was educated at Morrison's Academy, Crieth, and Edinburgh University, after having served in the Royal Artillery from 1916 to 1919, in which regiment he served again in the late war.

At Edinburgh University Mr. Henderson Stewart took his Bachelor of Commerce and his M.A. with honours in economics.

He has been the secretary of the Liberal Land Enquiry Committee and has served on the Advisory Council on Education in Scotland. Recently he was one of a group of M.P.s who toured North America to explore the market for agricultural machinery.

PERSONAL

Births.—Greenough.—To Pauline, wife of P. R. Greenough, M.R.C.V.S., of Florida Cottage, Castle Cary, Somerset—a sister, Rosalyn, for Timothy.

Hickman.—On April 29th, 1950, at The Cheriston Nursing Home, Kensington, to Beryl (*née Davies*), wife of John Hickman, M.R.C.V.S., a son.

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R.C.V.S. OBITUARY

Benson, Bernard Henry, late Capt. R.A.V.C. Graduated London, December 15th, 1903. Died at Hampstead, May 19th, 1950.

Brodie, Hamilton Hood, Capt. late R.A.V.C., 163, Newark Street, Greenock. Graduated Glasgow, May 21st, 1908. Died May 12th, 1950; aged 73 years.

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R.C.V.S. ANIMAL MANAGEMENT EXAMINATION

List of Successful Candidates

(*Continued from page* 308)

London

Anderson, D. C.
Biggs, P. M.
Bywater, J. E. C.
Carnaghan, R. B.
Carter, H. E.
Carter, J. B.
Clay, Daniel
Cox, J. A.
Cunningham, J. A. (Credit)
Fell, B. F.
Freudenthal, Gerald
Fry, N. C.
Gemmell, M. A.
Gillett, T. G. F.
Godfrey, M. J.
Hall, S. A.
Hawkins, Albert
Haxby, D. L.
Hayes, T. J.
Hooker, Miss P. M. W.
Hunter, F. E.
Jones, John Edward
Jones, Berwyn, M. D.
Jordan, A. N.
Kirby, M. A.
Levens-Ing, Miss P. J.
Malone, J. C.
Menard, R. J. R.
Michael, J. R.
Morris, A. D. (Credit)
Rabbich, P. D.
Reid, J. H. (Credit)
Richards, M. A. (Credit)
Rodgers, M. J.
Rudolph, E. W.
Russell, G. P. (Credit)
Samuel, R. M.
Shaw, D. L. (Credit)
Simpson-White, P. H.
Stear, R. T. (Credit)
Stockwell, G. D.
Swann, A. I.
Tew, N. C.
Thomas, J. L.
Townsend, G. H.
Tuckey, J. B.
Walker, Miss G. M.
Watson, K R.
White, R. C.

Liverpool

Davies, Owen (taken in London).

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SYDNEY UNIVERSITY FACULTY OF VETERINARY SCIENCE

Chair of Veterinary Physiology Established

We are indebted to Dr. Max Henry, Secretary of the Australian Veterinary Association, for information concerning the establishment of a Chair of Veterinary Physiology in the faculty of Veterinary Science of Sydney University, and the appointment thereto of Professor C. W. Emmens.

Professor Emmens, who is 36, holds the degrees of Doctor of Science and Doctor of Philosophy of London University. After graduation he was a research student in genetics and cytology at University College under Professor J. B. S. Haldane. He was then appointed to the research staff of the National Institute for Medical Research, London. During the period 1941-46 he was seconded for war duties. Dr. Emmens' special field of research has been sexual physiology, in which he has gained an international reputation.

The Australian Veterinary Association has extended to the Chancellor and Senate of the University its congratulations on the great step forward represented by the establishment of the new Chair in the training of veterinary students and the potential development of research. Our endorsement of that expression of satisfaction is wholehearted and, indeed, extends to the distinguished incumbent of the professorship, but we may perhaps be allowed to express the hope that the time is not too far distant when such appointments may be filled from the ranks of the veterinary profession.

The University Senate has accepted a grant for the creation of the Chair from the Australian Wool Industry Fund, but actually the establishment, staffing and equipping of the new Department of Veterinary Physiology has been going on for the last three years with funds provided by the Commonwealth Government, the Rural Bank, the Commonwealth Bank, the George Aitken Pastoral Research Trust, the Australian Meat Board, and Burroughs Wellcome & Co.

Our readers will be interested in the following information concerning the staff and the work of the newly created department furnished by Professor Emmens to Dr. Max Henry:—

Members of the Staff

Dr. C. W. Emmens, D.Sc., Ph.D., Professor.
Mr. J. D. Biggers, B.Sc., M.R.C.V.S., Lecturer.
Mr. I. G. White, B.Sc., Lecturer.
Mr. A. W. Blackshaw, B.V.Sc., Commonwealth Research Assistant.
Visiting Worker—Mr. G. Alexander, B.A.Sc., a member of the staff of C.S.I.R.O.

Research in Progress

1. The investigation of the physiology and metabolism of the spermatozoa of man and the domestic animals with particular reference to the effect of various diluents on the reactions of the cells at low temperatures.

2. Investigations of the intra-vaginal method of assaying natural and synthetic oestrogens with particular reference to:—
   (*a*) The determination of very small amounts of hormone in body fluids and plant extracts.
   (*b*) The possible light that these investigations may throw on the nature and behaviour of the oestrogen in Dwalganup early subterranean clover.

3. Studies on uterine circulation in various species with particular reference to the possibility of measuring the complete blood flow of the uterus in the sheep under various experimental conditions.

4. An investigation just started by Mr. Alexander of the possibility of adapting the method of Hooker and Forbes for the assay of progesterone to an *in vitro* technique.

Teaching Programme

A course of advanced physiology is given to third year veterinary students together with extensive practical exercises. Lectures are given on Endocrinology and Reproduction, The Nervous System, Ingestion, Digestion and Excretion in Domestic Animals, and on the relation of the animal to its external and internal environment. Practical classes cover some 120 hours and are divided into two main courses:—

1. Mammalian physiology as exemplified by the rabbit. In this course students are grouped into teams of four or five and undertake various operative procedures incident to the study of the nervous system, respiration, intestinal motility, blood volume measurements, etc.

2. More general physiology and biochemistry combined, with special reference to an appreciation of animal variability, the use of anaesthetics, drug action and studies of ruminal physiology. In these classes, frogs, rats, mice, rabbits and sheep are used.

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SLAUGHTER OF ANIMALS

In the House of Commons on May 16th, Mr. Spearman (Scarborough and Whitby) cited conditions in the Scarborough and Creech St. Michael (Somerset) slaughterhouses as some evidence that in Ministry slaughterhouses there was waste, deterioration in the quality of meat, and unnecessary suffering. Before the war (he continued) there were about 16,000 slaughterhouses. Did the Government intend to revert to that or was the Minister going to set up 12 super-slaughterhouses or was there to be something in between the two? Were they going to be erected by the Government or be privately owned or owned by the public authorities? Or were they to be owned by the public authorities and let out to private enterprise as in New Zealand, which seemed to be rather a sound plan? It was high time the Government produced a policy in this matter.

In the course of his reply, Mr. Frederick Willey, Parliamentary Secretary to the Ministry of Food, said it had now been decided that the Ministry of Works, on behalf of the Ministry of Food, should proceed immediately to build two Government experimental slaughterhouses, "at which we can test the experience we have gained from control since we took over the slaughterhouses." These were being built at Fareham and Guildford. This would not deal with the immediate problem, and this year advisory slaughterhouse committees were being set up in the several areas of Britain, under the chairmanship of the representatives of the meat and livestock officers, to consider again whether there were any additional slaughterhouses which could effectively be brought into use, having regard to the problems which had been mentioned.

NEW HILL FARMING ADVISORY COMMITTEE FOR SCOTLAND

Under the provisions of the Hill Farming Act, 1946, the Secretary of State for Scotland has constituted a new hill farming advisory committee for Scotland in succession to the one which recently completed its term of office. The function of the committee is to advise the Secretary of State in the exercise of his powers under the Hill Farming Act.

The members of the new committee are: Mr. William H. Hamilton (Chairman), Messrs. John A. Cameron, Ian M. Campbell, John Glendinning, David Maclennan, Alastair McNaughton, James J. Paterson, J. Fred Sproat, Duncan M. Stewart, Captain Thomas Elliot and Dr. J. Russell Greig. The Secretary of the committee is Mr. J. Cumming, Department of Agriculture for Scotland, St. Andrew's House, Edinburgh.

The committee has been appointed for a term of three years, from May 10th, 1950.

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ANTI-TSETSE DRUG TESTS IN EAST AFRICA

"Disappointing Results"

In its issue of May 19th *The Times* publishes, under the above headings, the following message from its Nairobi correspondent: "A disappointing report on the tests with the anti-tsetse drug antrycide is contained in the annual review of the work of the East African Veterinary Research Organisation. But experiments are continuing, particularly to test the supposition that the drug may act rather by suppressing infection than by totally inhibiting it. Observations made during field tests in Kenya have suggested that this might be so and though 'finality has not been reached' evidence is accumulating which supports this view. Experiments are planned this year to determine how antrycide can be used in local conditions, and the claims made for its prophylactic value are to be further investigated. These experiments will also include observations of the effect of using the drug at shorter intervals.

"The report describes experiments in the area between Nairobi and Mombasa, where 60 cattle protected by antrycide were introduced into the tsetse area last September. They developed trypanosomiasis within a month, and all except two were dead within four months, in spite of efforts to save them. The interesting and discouraging discovery was made that the trypanosomes had become largely resistant to antrycide. The report recalls that early results with this new drug were promising, though observations led to the adoption of a cautious attitude in claiming extended prophylactic properties for it. A new research area within a few miles of Mombasa has been selected for this year's experiments."

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The Poisons List and Rules

Proposed Changes

Statutory Instruments giving effect to recommendations made to the Secretary of State by the Poisons Board are being prepared. It is proposed, state the Home Office, to make the following changes in the Poisons List and Rules:

(1) *D. F. P.* (*Di-isopropyl-fluorophosphonate*) will be added to Part I of the Poisons List and included in the First and Seventh Schedules to the Poisons Rules. The special labelling requirements prescribed by the Seventh Schedule will apply to eyedrops as well as to injection solutions.

(2) *Deca-, Hexa-, Penta-, etc., methonium iodide* will be added to Part I of the Poisons List and included in the First and Fourth Schedules to the Poisons Rules. They will be listed as "polymethylene bis-trimethyl ammonium salts."

(3) *Antihistamine drugs* will be added to Part I of the Poisons List and included in the First and Fourth Schedules to the Poisons Rules. Exemption will be provided for preparations intended for external application only.

(4) *Synthetic drugs.*

(*a*) The following drugs to which Part III of the Dangerous Drugs Act, 1920 is shortly to be applied will be added to Part I of the Poisons List and included in the First Schedule to the Poisons Rules:—

Alphaprodine (*a*-4-propionoxy-4-phenyl-1:3-dimethyl-4-piperidine) its salts;
Betaprodine (*b*-4-propionoxy-4-phenyl-1:3-dimethyl-4-piperidine) its salts;
Hydroxypethidine (ethyl-4-*m*-hydroxyphenyl-1-methylpiperidine-4-carboxylate) its salts;
Isoamidone (6-dimethylamino-4:4 diphenyl-5-methylhexan-3-one) its salts;
Ketobemidone (4-propionyl-4-*m*-hydroxyphenyl-1-methylpiperidine) its salts;
Methadol (6-dimethylamino-4:4 diphenylheptan-3-ol) its salts;
Methadyl acetate (6-dimethylamino-4:4 diphenyl-3-heptylacetate) its salts;

(*b*) Part III of the Dangerous Drugs Act, 1920, will also be applied to phenadoxone, a poison at present included in Part I of the Poisons List and in the First and Fourth Schedules to the Poisons Rules under the description "6-morpholino-4: 4 diphenylheptan-3-one; its salts." The name "phenadoxone" and the present description will be adopted in Part I of the Poisons List and the First Schedule to the Poison Rules. The reference in the Fourth Schedule will be deleted as no poison in that Schedule is also subject to control under the Dangerous Drugs law.

(*c*) The British and American conventional form will be adopted in the Dangerous Drugs law for amidone, a poison included in Part I of the Poisons List and the First Schedule to the Poisons Rules "Amidone (D/L-2-dimethylamino-4: 4 diphenylheptan-3-one) its salts" will accordingly be deleted from Part I of the Poisons List and the First Schedule to the Poisons Rules and replaced by "Amidone (6-dimethylamino-4: 4 diphenylheptan-3-one) its salts.

(5) *Overage in Ampoules.*—Rules 7 and 12 of the Poisons Rules will be amended to legalise the supply in ampoules of an additional quantity of a poison sufficient to permit the withdrawal and administration of the quantity ordered and the amount prescribed.

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"Unwieldiness Through Inclusions in an Inappropriate Field"

Commenting on these amendments to the Poisons Rules which "although not in themselves extensive, cover a wide field of interest," *The Pharmaceutical Journal* observes "in considering all the possible implications we cannot help feeling that in the endeavour to keep apace with technical achievement poisons legislation in its present form is becoming unwieldy. The new substances now classified as poisons might more properly be regarded as medicines needing control in distribution and it may be asked whether the time has come to draw some distinction between such substances and the traditional poisons, a distinction which, while maintaining public safeguards, will not handicap the development or the professional usage of the articles. The sulphonamides were perhaps the first of these drugs so to be controlled; there are now many others, and several more are in future to be brought into this inappropriate field of poisons, a designation which in the circumstances runs the risk of losing its particular significance. We already have the Therapeutic Substances Act, Radio-active Substances Act and Penicillin Act to control particular types of preparations, and there may now be required a further measure which will control the sulphonamides, anti-histaminics and similar compounds so as to protect the layman in his proper usage of these preparations but will avoid the cumbersome restrictions of the Poison Rules."

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CAMBRIDGE UNIVERSITY SCHOOL OF VETERINARY SCIENCE

The *Cambridge Daily News*, in a report of an address given by Professor W. I. B. Beveridge, head of the University's Animal Pathology Department, at the annual meeting of the Cambridgeshire Branch of the R.S.P.C.A., quotes him as saying that it is hoped to begin work next month on the foundations of the new University School of Veterinary Science, situated at Madingley Road, Cambridge. When completed it will comprise a main teaching block containing lecture rooms and the like, a veterinary hospital, experimental farm and hostel. The finished plans are now before the University authorities and their approval is expected within the next few weeks.

The first three years of the six-year course, said Professor Beveridge, would culminate in the usual Natural Sciences Tripos, followed by three years of professional training. The School would cover two main departments—a Department of Animal Pathology and a Department of Veterinary and Clinical studies. The first department was already in being in the University and the second was formed on paper.

Describing the plans for the new buildings at Madingley Road, which he described as being "an ideal site," Professor Beveridge said that for the time being they would not be able to build the hostel, but it was hoped to make a start with the hospital and farm next month.

A big advantage of the School would be its situation in the country, so that the farm side could be combined at first-hand. This compared favourably with most cities, where the veterinary schools were forced to develop separate farm stations some distance away from their other activities.

Instancing that all such establishments had their own particular characteristics, Professor Beveridge said there were certain lines along which he hoped the School would develop. Its association with Cambridge University would give it a first-rate scientific background, which should equip students for subsequent training in research. He hoped a fair proportion would continue in research work after passing through the school.

Another aspect to be considered would be the School's obligation to the country. It would cost the nation a lot of money—probably

hundreds of thousands of pounds to establish and tens of thousands to maintain each year. What they could provide in return would have to be a consideration. The nation most wanted the safeguarding of its productive animals, he felt. So the School would be engaged in the subject of animal production—the maintaining of positive health among farm animals for ensuring greater production.

But the School would not be neglecting clinical work in respect of the purely companion animals. A good deal of its training would be done with regard to the smaller animals—particularly cats and dogs. In this way the School would look forward to help and co-operation from the R.S.P.C.A. clinical service. He was sure this would be to their mutual advantage.

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MINISTRY OF AGRICULTURE NEWS SERVICE

Chicken Rearing over 25 Years.—In the early '20s it was usual for most poultry farms to lose about 40 per cent. of all chickens hatched. From figures issued by Armstrong College in 1930, the hatchability in the northern counties of England was 60 per cent. of all eggs set. In 1949 the proportion of chicks hatched increased to 70 per cent. and the rearability losses reduced to between 10 and 15 per cent

The high mortality which used to be common on most farms during the first ten days of life was undoubtedly due mostly to bacillary white diarrhoea. Blood testing, which came into general use about 1927, has greatly reduced this disease, and the insistence by the Ministry of Agriculture that all birds on accredited and probationary farms must be tested until clear of reactors has been amply justified.

Systems of rearing have not, on the whole, changed greatly. The pyramid type of hover, heated by a paraffin lamp, is still one of the most popular, especially among those who rear only a few replacements each season. The change-over to electric incubators and rearing equipment which took place on many special flock farms during the war has received a check, owing to the present day risks of power cuts. Battery brooders, which were very popular in the early '30s, are now found mainly at hatcheries for carrying on surplus chicks and on large farms when there is a sale for pullets. Many poultry farmers believe that this system of rearing, which undoubtedly keeps the mortality down in the early stages, rears a soft chick, liable to disease in its laying years.

Twenty-five years ago chickens were reared on a free-range system, since it was found that those left in the brooder houses went off their legs after about three weeks. This was due as we now know, to a shortage of vitamin D. When it was found that cod-liver oil and direct sunlight would prevent this trouble, intensive rearing became popular, since by rearing intensively to six weeks the losses from gapeworm, which were severe amongst chickens on range, were eliminated. It was found that after six weeks chickens develop a natural immunity to gapes and at the same time the life cycle of the gapeworm was broken for future years. Due to this policy, gapes is a disease practically unknown to modern poultry farmers.

At the end of the '20s losses began to rise from coccidiosis—a disease caused by a parasite which can remain dormant in the soil from year to year. For a few years good results were obtained by intensive rearing, then it was found that, despite all precautions, the disease affected even these chicks. During the war the value of sulpha drugs was discovered and for most poultry farmers coccidiosis is a thing of the past.

Years ago there used to be much loss through chickens at six to 14 weeks of age being crushed in their houses. The night ark or slatted floor has done much to check this, through better ventilation.

The sexing of day-old chicks, first demonstrated by the Japanese at the World Poultry Congress in Rome in 1933, has had a tremendous effect on the industry, especially during the last ten years, when foodstuffs have been so scarce. For a time it was thought that only Orientals could do this work, but now there is a good supply of qualified sexers working in hatcheries all over the country.

The steady progress made in the last quarter of a century towards solving the poultry-keeper's problems affords hope that in the years to come, even with the prospect of high capital and labour costs, much can still be done to improve the efficiency of the poultry industry.

. . . . .

Winter Feeding of Breeding Ewes in Breconshire.—A familiar sight on the farms of Breconshire during January, February and early March, has been a flock of in-lamb ewes folded on swedes. The practice is very old, and it goes on in spite of the well-publicised difficulties of short and costly labour for singling. It is generally restricted to lowland farms where large flocks of either pure-bred or cross-bred ewes form a very substantial income-earning section of the farm enterprise. While the "build-up" of fertility arising from folded sheep is well known, the real reason lies elsewhere. It arises from the high ewe populations which, for the greater part of the year, are supported quite well on leys and pastures. The "dead" months of January, February and March are, however, a bottle-neck as regards available food supplies and to ease the burden at this time the swede crop has, by long experience, proved to be the safest crop yet available.

In addition to increasing the physical fitness of ewes, the stimulating effect on milk production is an equally valuable function of the swede crop. The practice is, therefore, one of "steaming up" preparatory to lambing. Whether the extra milk is obtained from the crop's dry matter or its water content is an interesting point. Probably both are equally important. Alan Fraser in his book on Sheep Husbandry states that during the last few weeks before lambing, pregnant ewes almost doubled their consumption of water, but presumably he did not use "crop" water.

The period of folding varies from six to eight weeks, depending upon the condition of the flock and the quality of the crop. In the ordinary way two to three hours per day is the permitted folding time for the first few days, but this lengthens as the crop gets less, after which the ewes are returned to the adjoining pastures. Part of the crop, enough to last a week or so, is first separated off by a fence of posts and sheep netting wire, lightly but firmly erected, which is moved three or four times before the crop is entirely consumed.

Once lambing begins, the ewes and lambs are immediately removed to fresh leys, when mangolds are fed to replace swedes.

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LEGAL NOTES

Cruelty to Sheep in Transit.—John O'Connor, dealer, of Ballymacelligott, Tralee, Co. Kerry, was fined £40 and two guineas costs in Ennis, Co. Clare, for cruelty to sheep by: (1) not providing them with food and water during a period of some 36 hours; and, (2) conveying them in a lorry in a manner that caused them unnecessary suffering.

Superintendent J. S. Flynn, prosecuting, said (reports the *Irish Times*) that O'Connor bought 22 sheep and eight lambs at Gort fair on April 4th, took them by lorry to Ennis that evening, left them unattended overnight, and, having bought additional sheep and lambs at Ennis fair on April 5th, took the lot to Tralee, arriving there about 7 p.m. Throughout that time the animals got nothing in the way of food or water, and, in the case of those bought at Gort, they must have been left without any attention for at least 36 hours. In addition, the lorry was so overcrowded that many of the sheep and lambs were trampled upon.

Mr. D. Fitzpatrick, veterinary surgeon, gave evidence that, at the request of Guard McDonagh, he examined the lorry load of sheep at Ennis on April 5th on its way from Ennis fair. Those on the upper deck had a fair amount of room but five were being trampled on and one was in an exhausted state. At least three in the bottom creel were also being trampled on. In his opinion, if the sheep had been left over 15 hours without food or water there would have been unnecessary cruelty and suffering, and anything over 24 hours would be very serious.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

SUPEROVULATION IN THE COW

Sir,—L. W. Fuller's communication on superovulation in the May 13th issue of *The Veterinary Record* indicates the considerable variation in response to gonadotrophin which occurs in cattle. It is possible that in the case to which he refers the pre-treatment with stilboestrol played some part, for in young animals injected with P.M.S. a much greater response is obtained if oestrogens are injected first.

In experimental work on egg transplantation where superovulation is a first essential the response to doses of 2,000 units of P.M.S. has, in some cases, been surprisingly great and as many as ten follicles have been produced in each ovary with this dosage. It is hardly surprising therefore, that in some cases 1,500 units will produce four ova.

One or two other points of interest have arisen during this work. The first is that if the P.M.S. is injected in the presence of a corpus luteum, there is usually considerable follicle production, but those produced do not ovulate unless an intravenous

dose of L.H. is given. Most cows treated in this way do not show signs of oestrus, and there may be a tendency to regard the injection as a failure and repeat it. This, incidentally, is a possible method of increasing luteal tissue in cases of persistent abortion due to luteal failure.

The second point is that the ova shed after P.M.S. and L.H. injection and where a corpus luteum is present in the ovary pass down the fallopian tube at a greatly accelerated rate, and have been found in the uterus within 48 hours after oestrus. Of some 100 ova examined after this form of treatment not a single one has been fertilised. It is believed that these ova are, in fact, fertilisable, but that there is a greatly increased liquid flow through the fallopian tube due to progesterone, and that the sperms do not pass up the tube for fertilisation. This rapid descent can be slowed up by the injection of stilboestrol after ovulation. It seems quite possible that this variation in the speed of descent of the ovum, which appears to be controlled by the progesterone oestrogen balance, may be an important factor in so-called functional infertility.

The effectiveness of whole P.M.S. which has been recently assayed is almost 100 per cent. and of the large number of cattle used experimentally for superovulation work not a single failure of follicle production has occurred using doses of 2,000 to 4,000 units.

Yours faithfully,

L. E. Rowson.

Cambridge and District Cattle Breeders Ltd.,
The Gravel Pits,
Huntingdon Road,
Cambridge.

May 17th, 1950.

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MASTITIS MEDICATION IN RELATION TO PUBLIC HEALTH

Sir,—The publication in *The Lancet* of May 13th, by Dr. Rosemary Davies, of a case of poisoning by "Udolac" seems to me to necessitate prompt action being taken, in regard to two things:—

1. The production of poisonous or toxic drugs for introduction into a cow's udder;
2. The labelling of such poisonous drugs.

As regards (1), admittedly farmers are generally advised not to use the milk of a cow under treatment for mastitis, but it does not necessarily follow that the instructions will be obeyed. In the case of "Udolac" and "Streptomycin," serious consequences could ensue if milk from a cow, which has been treated with either, was used from the infected quarter, before the drugs had been fully dissipated.

It would appear that more exhaustive investigations into the rate of absorption of these drugs, and also the rate of re-excretion into the milk, should be made, before they are allowed on the market.

(2) In the case of "Udolac," the case quoted in the *Lancet* of a girl of 22 months who became very ill in two and a half hours after swallowing 5 grammes of Udolac, and who died 55 hours later, indicates that the drug is very toxic. Surely such a drug marketed in 35 gramme tubes should be very clearly labelled "Poison."

The time is overdue, when a *competent* committee should be set up to investigate fully the effects of mastitis "cures" in relation to Public Health.

Yours faithfully,

R. W. Johnston.

Rose Cottage,
Longside,
Aberdeenshire,

May 15th, 1950.

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EXPERIMENTATION UPON FARM ANIMALS CARRIED OUT WITHOUT THE ACTIVE CO-OPERATION OF A VETERINARY SURGEON

Sir,—In the Supplement to *The Veterinary Record* (Supp. **11.** 2) of April 15th, page 24, there are given under the above heading recommendations from the Association of Veterinary Teachers and Research Workers to the Council N.V.M.A.

As my name is mentioned in connection with these recommendations may I be allowed to say that they do not fully incorporate the fundamental point of my original proposals that were concerned with active participation in the actual experimentation. It might clarify the point if my original questions to the Council N.V.M.A. were repeated, *viz.*:

1. Should anyone other than a veterinary surgeon be charged with the responsibility of assessing
   (*a*) the result(s) of the experiment on the animal(s)?
   (*b*) the possible influence on the result(s) of extraneous factors, such as disease, housing, mismanagement?
2. In the absence of such assessment can the results be accepted as accurate?

From the luke-warm reception given by the Parliamentary and Public Relations Committee to the second of the modified proposals there appears to be little chance of any real activity in the matter, but hope dies hard and I had believed that the moral support of the new Veterinary Surgeons Act might have been a stimulus.

Yours faithfully,

John C. Grant.

Aberdeen.

April 29th, 1950.

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ATTESTATION: IS IT A GOOD POLICY?

Sir,—In your issue of May 6th, 1950, you publish a letter from Mr. John Francis in reply to mine of February 11th. The point is made that the profession has performed a useful service in attempting to eradicate tuberculosis from animals. This is undoubtedly true, so far as the animals are concerned, but the whole scheme of my letter was to indicate that the lessening of tuberculosis infection in animals has led to an increase in human notifications and deaths. Without repeating the whole summary of notifications, I will give the final figures: Scotland, 1928—6,203; 1947—7,984; England and Wales 1924—57,503; 1946—42,173; the greatest increase in Scotland has been since the attestation scheme commenced. Mr. Francis makes the positive assertion that attestation is a good policy; can he substantiate that view when more than 2,000 people are dying each year from tuberculosis in Scotland than was the case before the initiation of the attested scheme?

All I have tried to do is to bridge the gap between the reduction of infection in cattle on the one hand and the striking increase in human mortality on the other. The two, in my opinion, must be related.

The statistics regarding the loss of meat are useful, but a dairy cow is kept primarily for the production of milk and unless her udder becomes infected she is only of slight potential danger to other cattle or human beings; her slaughter value is of small importance.

Mr. Francis questions the advisability of the installation of pasteurisation plants. Has he any experience of the milk trade? Retailers do not install a £1,000 plant or more as a philanthropic gesture, but to prevent the milk going sour, which is caused, as we all know, by the action of bacteria in the milk and the common mastitis organisms are the most potent causes. I can only quote my experience that there is a 50 per cent. higher incidence of mastitis in T.T. herds than in the non-designated, caused I feel sure by continually washing the cow's udder with cold water and some detergent or other.

Regarding the reduction of ill-health in dairy herds as a result of testing, is Mr. Francis able to give one condition that has been improved as a result of attestation, excepting, of course, tuberculosis? Mastitis is undoubtedly much more prevalent. Abortion is controlled by vaccination but retained afterbirths are much more common, while sterility (of all kinds) without any doubt is much more of a problem than in non-T.T. herds. Johne's disease much about the same. These are the results of my own observations so I cannot accept the idea that clearing a herd of tuberculosis is the end of all disease problems.

The idea that tuberculosis or the products of the tubercle bacillus produce immunity to active infection, is, I agree, supposition, but this supposition is I submit strongly supported by the fact that without it there is a marked rise in infection. The medical authorities have had B.C.G. vaccine for the last 30 years and are still very diffident about using it, while nature, to use a colloquialism, has supplied the antibody and we are using all our energies to destroy it.

Mr. Rainey does not give much to which to reply. Mr. Tutt in your issue of May 20th indicates with Mr. Francis that herd health usually improves after the attested standard is reached. Undoubtedly there are not so many of the common chills that used to exist, but regarding the other conditions I can only refer him to the answer to Mr. Francis.

Regarding the Accredited Herd scheme which is due to terminate in 1954, my only disagreement with Mr. Tutt is that in my view no milk which comes below that standard should then be allowed to be sold. I feel sure there should be a minimum factor for the bacterial content of all milk.

Yours faithfully,

L. Pitcher.

66, Coningsby Road,
High Wycombe.

May 22nd, 1950.

NATIONAL VETERINARY MEDICAL ASSOCIATION

Annual Congress, Cardiff, 1950

PROVISIONAL PROGRAMME

All Papers will be presented and discussed at the Technical College, Cardiff.

Sunday, September 3rd

7.00 p.m. "At Home" in the Whitehall Rooms, Park Hotel, given by the South Wales Division, N.V.M.A.

Monday, September 4th

10.30 a.m. Civic welcome by the Lord Mayor of Cardiff in the Cardiff Technical College.

11.00 a.m. Official opening of the Trades Exhibition in the Technical College.

11.15 a.m. Paper: "Factors Influencing Herd Fertility in Cattle." Writer: S. L. Hignett (Frant). Openers: D. W. Deas (Lasswade); J. Smith (Carmarthen); H. W. Steele-Bodger (Tamworth).

2.00 p.m. Ladies' pleasure trip to Porthcawl, returning at about 5 p.m.

2.15 p.m. Surgical and other Demonstrations at Whitchurch Mental Hospital Farm.

3.00 p.m. Film Show at the Technical College.

7.30 p.m. Civic Reception at Assembly Room, City Hall.

Tuesday, September 5th

9.30 a.m. Paper: "Clinical Diagnosis of Diseases of the Abdomen in the Dog and Cat." Writer: J. S. J. Lauder (Hale Barns). Openers: Miss O. D. James (Cardiff); J. W. Heney (Dublin).

11.00 a.m. Ladies' pleasure trip to the Wye Valley, returning about 4.30 p.m.

11.00 a.m. Paper: "Some Pig Diseases." Writers: H. G. Lamont, D. Luke and W. A. M. Gordon, (Belfast). Openers: P. L. Shanks (Leeds); J. F. Timoney (Dublin).

2.15 p.m. Surgical and other demonstrations at Whitchurch Mental Hospital Farm.

3.00 p.m. Film Show at the Technical College.

5.00 p.m. N.V.M.A. Council Meeting in the Council Chamber, City Hall.

7.30 p.m. President's Reception at the Park Hotel.

Wednesday, September 6th

10.30 a.m. Paper: "Deficiency Diseases, particularly Acetonaemia." Writer: Dr. Carlstrom (Sweden). Openers: R. H. Smythe (Nottingham); J. R. Holmes (Liverpool University Veterinary Field Station).

2.30 p.m. Congress Photograph on the steps of the Museum.

3.00 p.m. N.V.M.A. Annual General Meeting at the Technical College.

7.30 p.m. Annual Banquet in the Park Hotel.

Thursday, September 7th

10.00 a.m. Paper: "Symposium on Sheep Diseases." Writers: S. Jamieson (Aberdeen); L. E. Hughes (Aberystwyth); W. T. Rowlands (Bangor); J. T. Stamp (Edinburgh). Openers: D. E. Davies (Cornwall); D. R. Allen (Cardiff).

11.45 a.m. Sectional Meetings.

Afternoon. (*a*) Bowls Competition at the invitation of the Barry Athletic Club. (Organiser: R. W. Hall, Barry.) Tea at the Merrie Friars Café, Barry, at the invitation of the President, South Wales Division—R. W. Hall.

(*b*) Golf Competition at the Penylan Golf Club. (Organiser: C. J. Pugh, Newport.)

8.00 p.m. Ladies' Guild Dance. Park Hotel.

Friday, September 8th

10.00 a.m. Paper: "Diseases of the Ruminant Stomach." Writer: H. Begg (Strathaven). Openers: A. T. Morgan (Carmarthen); D. G. E. Davies (Llandyssul).

11.30 a.m. Paper: "Strain 19 and the Control of Brucellosis." Writer: J. R. Lawson (Weybridge). Openers: A. J. Wright (Macclesfield); L. Guy Anderson (Aylesbury).

2.30 p.m. Closing Meeting of the Congress at Cardiff Technical College.
Council Meeting N.V.M.A. at Cardiff Technical College.

N.V.M.A. CONGRESS AT CARDIFF

Hotel Accommodation

We are advised that hotel accommodation available in Cardiff at the time of the N.V.M.A. Congress (September 3rd to 8th inclusive) is limited.

Members are urged, therefore, to book their rooms as early as possible, and to facilitate this we reproduce below particulars of such block reservations as the Provisional Committee has been able to make. They are asked to note specially :—

1. That these particular reservations are contingent on applications being received from members at least two months prior to the opening of the Congress ;
2. That applications should be made direct to the hotel concerned and *not* to the Local Secretary ; and
3. That, in making application, members should mention the fact that they are veterinary surgeons attending the Congress.

	Block Reservations			*(All nett charges)*		
	Single Rooms	*Twin-Bedded Rooms*	*Double-Bed Rooms*	*Bed and Breakfast (Single)*	*Bed and Breakfast (Double)*	*Board Per Day*
Angel Hotel, Westgate Street, Cardiff... ...	10	6	5	19/6	39/–	30/6
Alexandra Hotel, Queen Street, Cardiff ...	—	4	2	14/6	29/–	23/–
Queen's Hotel, St. Mary Street, Cardiff ...	2	11	8	16/6	33/–	24/6
Barry's Hotel, St. Mary Street, Cardiff ...	10	5	10	16/6	32/–	25/–
Sandringham Hotel, St. Mary Street, Cardiff...	12	6	3	15/–	30/–	23/–
Park Hotel, Park Place, Cardiff (Headquarters Hotel)	30	16	12	16/6	33/–	25/6
Marine Hotel, Barry Island	—	2	2	14/6	29/–	21/–
Barry Hotel, Barry	3	3	3	14/6	29/–	24/–
Esplanade Hotel, Penarth	6	6	6	15/6	31/–	25/6
	73	59	51			

ADDITIONAL HOTELS WITHOUT RESERVATIONS

We have also been furnished with the following list of additional hotels to which applications for accommodation also can be made. Here, again, the necessity for early application is stressed.

Railway Station Hotel, Station Approach, Cardiff.

Philharmonic Hotel, St. Mary Street, Cardiff.

Gwalia Hotel, Barry.

Ship Hotel, Barry.

Seafield Hotel, 14, The Parade, Barry.

PRIVATE HOTELS

" Cedars," Fidlas Road, Cardiff.
" Ashburton," 227, Newport Road, Cardiff.
Mrs. Kennett, 60, Park Place, Cardiff.
Mrs. Cleves, 8, Tydraw Road, Cardiff.
Hamilton Guest House, 82, Penylan Road, Cardiff.
Mrs. Hesbronder, 233, Allensbank Road, Cardiff.
St. David's Hotel, 103, Newport Road, Cardiff.
Mrs. Woodward, 193, Newport Road, Cardiff.
Mr. Begg, 36, Hamilton Street, Cardiff.
Mrs. Springett, 26, Column Road, Cardiff.
Lyndon Court Hotel, 191, Newport Road, Cardiff.